

AMENDMENTS TO THE CLAIMS

This listing of claims replaces all prior versions, and listings, of claims in the application:

1        1. (Currently Amended) A method ~~for use with~~ performed by software embodied in  
2        a computer-readable storage medium and executed by a computer in a database system that  
3        stores a join view associated with plural base relations, the method comprising:

4                receiving modification operations that modify at least two of the base relations of  
5        the join view, wherein the at least two base relations comprise a first base relation and a second  
6        base relation; [[and]]

7                performing partitioning of the received modification operations by submitting at  
8        least some of the modification operations operating on the first base relation to a first session,  
9        and submitting at least another of the modification operations that operate on the second base  
10      relation to a second session;

11                grouping the at least some of the modification operations in the first session  
12      operating on the first base relation into a first transaction,

13                wherein the at least another modification operation in the second session is part of  
14      a second transaction; and

15                ~~re ordering the received modification operations~~ schedule the transactions to  
16      avoid execution of modification operations of more than one of the at least two base relations at  
17      one time in the database system.

1        2. (Currently Amended) The method of claim 1, wherein receiving the modification  
2        operations comprises receiving a first modification operation to modify a first base relation of the  
3        join view, and a second modification operation to modify a second base relation of the join view,  
4                wherein re ordering the modification operations scheduling the transactions  
5        comprises:

6                determining that the first modification operation transaction conflicts with  
7        the second modification operation transaction based on the first and second modification  
8        operations transactions modifying more than one base relation of the join view; and  
9                selecting one of the first and second modification operations transactions  
10      for execution in the database system.

1           3. (Currently Amended) The method of claim [[1]] 2, wherein selecting one of the  
2 first and second ~~modification operations~~ transactions comprises selecting the first ~~modification~~  
3 ~~operation transaction~~,  
4                   the method further comprising storing the second ~~modification operation~~  
5 transaction in a queue.

1           4. (Currently Amended) The method of claim 3, further comprising waiting for the  
2 first ~~modification operation transaction~~ to complete execution before scheduling the second  
3 ~~modification operation transaction~~ for ~~operation execution~~.

1       5. (Currently Amended) The method of claim 4, further comprising A method performed  
2       by software embodied in a computer-readable storage medium and executed by a computer in a  
3       database system that stores a join view associated with plural base relations, comprising:  
4               receiving a first modification operation to modify a first base relation of the join  
5       view, and a second modification operation to modify a second base relation of the join view; and  
6               re-ordering the received modification operations to avoid execution of  
7       modification operations of more than one of the first and second base relations at one time in the  
8       database system,  
9               wherein re-ordering the modification operations comprises:  
10               determining that the first modification operation conflicts with the second  
11       modification operation based on the first and second modification operations modifying more  
12       than one base relation of the join view;  
13               selecting the first modification operation for execution in the database  
14       system;  
15               storing the second modification operation in a queue;  
16               waiting for the first modification operation to complete execution before  
17       scheduling the second modification operation for operation;  
18               receiving a third modification operation to modify the first base relation of the  
19       join view, the method further comprising:  
20               storing the third modification operation in the queue; and  
21               scheduling the third modification operation for execution in the database system  
22       ahead of the second modification operation.

1       6. – 7. (Cancelled)

1        8. (Currently Amended) The ~~method of claim 1, further comprising:~~ A method  
2 performed by software embodied in a computer-readable storage medium and executed by a  
3 computer in a database system that stores a join view associated with plural base relations,  
4 comprising:

5                receiving modification operations that modify at least two of the base relations of  
6 the join view;

7                re-ordering the received modification operations to avoid execution of  
8 modification operations of more than one of the at least two base relations at one time in the  
9 database system; and

10                in response to a particular one of the modification operation operations to modify  
11 one of the base relations, placing an exclusive lock on the one base relation, and placing a  
12 predefined lock on the join view,

13                the predefined lock conflicting with either each of a shared lock [[or]] and an  
14 exclusive lock placed on the join view, but the predefined lock not conflicting with another  
15 predefined lock placed on the join view.

1        9. (Currently Amended) The method of claim 1, further comprising:

2                storing pending modification operations transactions in plural queues  
3 corresponding to respective plural sessions of the database system; and

4                selecting one of the pending modification operations transactions from the queues  
5 to schedule for execution in the database system based on whether the one pending modification  
6 operation transaction conflicts with one or more executing modification operations transactions  
7 in the database system.

1        10. (Currently Amended) The method of claim 9, further comprising determining  
2 that the one pending modification operation transaction conflicts with the one or more executing  
3 modification operations transactions in response to determining that the one pending  
4 modification operation transaction modifies a different one of the base relations of the join view  
5 than a base relation of the join view modified by an executing modification operation  
6 transaction.

1           11. (Currently Amended) The method of claim 9, further comprising applying a  
2 technique to prevent starvation of a particular one of the pending ~~modification operations~~  
3 ~~transactions~~ in response to determining that the particular one pending ~~modification operation~~  
4 ~~transaction~~ has been in one of the queues for longer than a predetermined time period.

1           12. (Currently Amended) An article comprising at least one computer-readable  
2 storage medium containing instructions that when executed cause a ~~system computer~~ to:  
3           receive modification operations that modify at least two of the base relations of a  
4 join view, wherein the at least two base relations comprise a first base relation and a second base  
5 relation;  
6           perform partitioning of the received modification operations by submitting at least  
7 some of the modification operations operating on the first base relation to a first session, and  
8 submitting at least another of the modification operations that operate on a second base relation  
9 to a second session;  
10           group the at least some of the modification operations in the first session  
11 operating on the first base relation into a first transaction,  
12           wherein the at least another modification operation in the second session is part of  
13 a second transaction; and  
14           re-order the received modification operations schedule the transactions to avoid  
15 concurrent execution of ~~modification operations~~ transactions of more than one of the at least two  
16 base relations of the join view.

1        13. (Currently Amended) The article of claim 12, ~~wherein receiving the modification~~  
2 ~~operations comprises receiving a first modification operation to modify a first base relation of the~~  
3 ~~join view, and a second modification operation to modify a second base relation of the join view,~~  
4                ~~wherein re-ordering the modification operations scheduling the transactions~~  
5 comprises:

6                determining that the first ~~modification operation transaction~~ conflicts with  
7 the second ~~modification operation transaction~~ based on the first and second ~~modification~~  
8 ~~operations transactions~~ modifying more than one base relation of the join view; and  
9                selecting one of the first and second ~~modification operations transactions~~  
10 for execution in the database system.

1        14. (Currently Amended) The article of claim 13, wherein selecting one of the first  
2 and second ~~modification operations transactions~~ comprises selecting the first ~~modification~~  
3 ~~operation transaction~~,

4                the instructions when executed causing the system to further store the second  
5 ~~modification operation transaction~~ in a queue.

1        15. (Currently Amended) The article of claim 14, wherein the instructions when  
2 executed cause the ~~system computer~~ to wait for the first ~~modification operation transaction~~ to  
3 complete execution before scheduling the second ~~modification operation transaction~~ for  
4 ~~operation execution~~.

1        16. – 17. (Cancelled)

1        18. (Currently Amended) The article of claim 12, wherein the instructions when  
2        executed cause the ~~system~~ computer to:

3                in response to a particular one of the modification ~~operation~~ operations to modify  
4        one of the base relations, place an exclusive lock on the one base relation, and place a predefined  
5        lock on the join view,

6                the predefined lock conflicting with ~~either~~ each of a shared lock [[or]] and an  
7        exclusive lock placed on the join view, but the predefined lock not conflicting with another  
8        predefined lock placed on the join view.

1        19. (Cancelled)

1        20. (Currently Amended) The first system of claim [[19]] 22, wherein the controller  
2        is adapted to identify the modification operations on the second base relation as conflicting with  
3        the modification operations on the first base relation in response to determining that the  
4        modification operations on the second base relation are modifying a different base relation of the  
5        join view than the modification operations on the first base relation.

1        21. (Currently Amended) The first system of claim [[20]] 22, ~~wherein the system~~  
2        ~~comprises a first system, and~~ wherein the controller is adapted to open plural sessions with [[a]]  
3        the database system ~~that is~~ separate from the first system,

4                the controller to further:

5                ~~determine that the~~ identify modification operations on the first base  
6        relation ~~that~~ modify distinct portions of the first base relation; and

7                ~~in response to determining that the modification operations on the first~~  
8        ~~base relation modify distinct portions of the first base relation,~~ submit the identified modification  
9        operations [[on]] ~~that modify distinct portions of the first base relation~~ through different sessions  
10      for concurrent execution in the database system.

1        22. (Currently Amended) ~~The system of claim 20, wherein the system comprises a~~  
2 ~~first system, A first system comprising:~~  
3        a controller having one or more processors to:  
4            receive modification operations to modify plural base relations of a join  
5 view, the modification operations comprising modification operations to modify a first base  
6 relation of the join view, and modification operations to modify a second base relation of the join  
7 view; and  
8            re-order the received modification operations to avoid concurrent  
9 execution of modification operations of more than one of the plural base relations of the join  
10 view,  
11            the re-ordering to cause modification operations on the first base relation  
12 of the join view to be scheduled for execution, and to cause modification operations on the  
13 second base relation to be queued for execution after completion of the modification operations  
14 on the first base relation,  
15            wherein certain of the modification operations on the first base relation  
16 comprises comprise modification operations of a ~~first tuple~~ set of one or more tuples of the first  
17 base relation, and wherein the controller is adapted to:  
18            group the modification operations on the ~~first tuple~~ set of one or more  
19 tuples of the first base relation into a transaction; and  
20            submit the transaction to a database system separate from the first system  
21 for execution.

1        23. (Currently Amended) The first system of claim [[19]] 22, wherein the controller  
2 comprises a load utility to submit the modification operations to [[a]] the database system.

1        24. (Currently Amended) The first system of claim 23, wherein the load utility  
2 comprises a continuous load utility.

1        25. (Currently Amended) The first system of claim 23, wherein the load utility  
2    comprises a first load utility, and the controller comprises a second load utility to concurrently  
3    submit other modification operations to the database system.

1        26. (Currently Amended) The first system of claim 25, further comprising plural  
2    platforms on which corresponding first and second load utilities are executable.